

Eclipse XDB-CN Provides Excellent Selectivity and Resolution for Urea Pesticides Application

Environmental, Agriculture

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Introduction

The ideal separation of a complex sample, such as mixtures of pesticides, can be difficult to obtain. This type of mixture often has both polar and nonpolar compounds in it. An HPLC separation on a C18 reversed phase column, such as the Eclipse XDB-C18 column, will often be long and inefficient. For this type of sample a more polar bonded phase is a better choice. A more polar, Cyano bonded phase, such as the Eclipse XDB-CN, can reduce the retention times (RTs) of the most nonpolar analytes while still maintaining good retention of the more polar analytes.

Highlights

- Use Eclipse XDB-CN for polar and nonpolar analytes
- High resolution, efficient separations

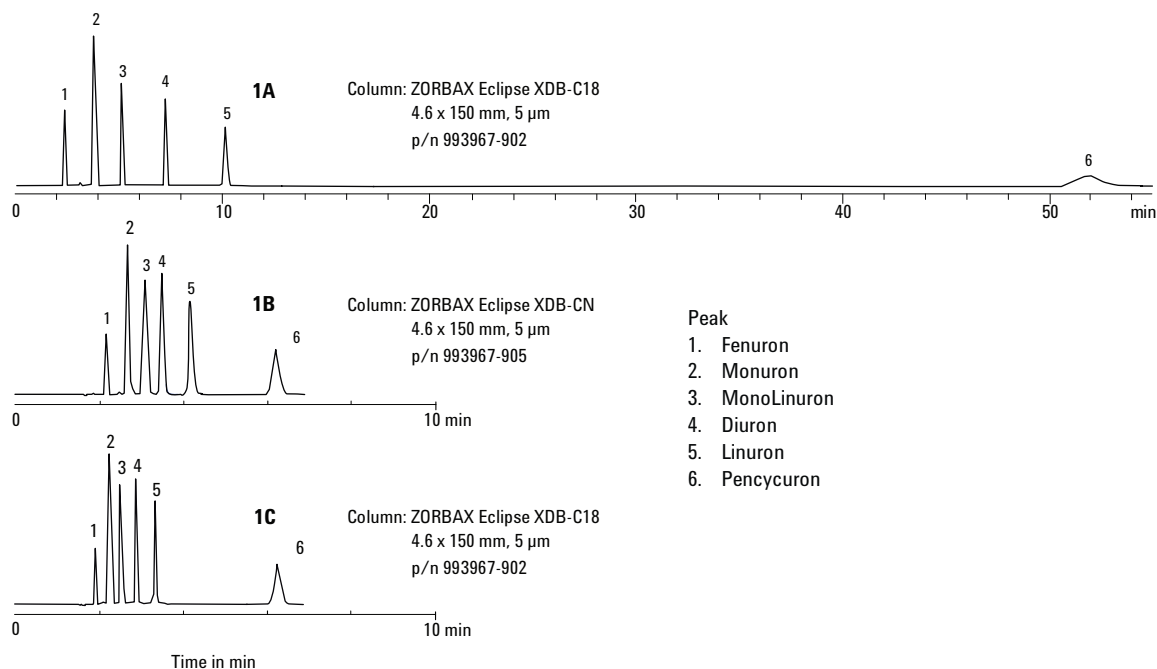


Figure 1. Comparison of Eclipse XDB-CN versus Eclipse XDB-C18 for the analysis of urea pesticides.

Conditions

Flow rate 1 mL/min
Temperature 25 °C

Mobile phase

1A, 1B: 60:40 MeOH: Water
1C: 78:22 MeOH: Water



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Experimental

All separations were performed isocratically at 1 mL/min and at 25 °C with the eluent compositions specified in the Figures. An Agilent 1100 Binary pump was used with online mixing of the organic and aqueous solvents. Pesticide standards were purchased from AccuStandard, Inc. as 100 µg/mL solutions in MeOH. One hundred microliters of each (300 µL of pencycuron) was added to a 2-mL vial and diluted with 400 µL of water. Twenty-microliter injections were made with an Agilent 1100 autosampler. HPLC columns are specified in the figure.

Results and Discussion

Figure 1 shows the separation of a mixture of six urea pesticides on the Eclipse XDB-C18 and the Eclipse XDB-CN column. On the Eclipse XDB-C18 column (Figure 1A) all peaks are well resolved, but the analysis time is 54 minutes due to the excessive retention of the pesticide pencycuron. When the pesticides are separated using the more polar selectivity of the Eclipse XDB-CN column (Figure 1B), and using the same mobile phase conditions, we see the analysis time is reduced by 85%, primarily because the retention of the most nonpolar pesticide is reduced. At the same time high resolution of all components and the trace impurities has been maintained.

Figure 1C shows that by increasing the organic in the mobile phase, the retention time of the last peak can be reduced on the Eclipse XDB-C18 to match that of the Eclipse XDB-CN column. However, the more polar compounds in the mixture are then less well-retained and not as well-resolved on the Eclipse XDB-C18 than on the Eclipse XDB-CN.

Conclusion

The Eclipse XDB-CN column, with its more polar bonded phase, provides the best separation of this mixture of polar and nonpolar urea pesticides. In general, Eclipse XDB-CN may provide a better separation of mixtures containing both polar and nonpolar components.

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